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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/726,676	11/29/2000	Andrew W. Wilson	ADAPP135	2040

7590 04/08/2005

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EXAMINER	
ALAM, UZMA	
ART UNIT	**PAPER NUMBER**
2157	

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/726,676	WILSON, ANDREW W.
	Examiner	Art Unit
	Uzma Alam	2157

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *07 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to the amendment filed on June 7, 2004. Claims 1-40 are pending. Claims 1-40 represent a method for congestion control.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-40 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Jain et al. US Patent No. 5,675,742. Jain discloses the invention as claimed including a method and system for handling congestion in a network and optimizing the transfer of data in the network (see abstract).

As per claim 1, Jain discloses a method for optimizing data transmission in a data transfer system comprising:

monitoring a level of data transfer congestion within the data transfer system, the monitoring including marking data, during data transfer congestion and detecting marked data (monitoring the amount of data being sent and setting the congestion avoidance flag column 5, lines 44-67; column 6, lines 1-40 and 56-65; column 8, lines 1-7; Figure 4); and

adjusting a data transfer rate corresponding to the level of data transfer congestion (adjusting the rate; column 6, lines 16-33; column 8, lines 8-55);

wherein the adjusting includes reducing the data transfer rate in direct correlation to the level of data transfer congestion as indicated by each marked data and increasing the data transfer rate in direct correlation to a lack of data transfer congestion as indicated by unmarked data during a round trip time (RTT) (checking for a flag and adjusting the rate accordingly; column 7, lines 18-28 and 58-67; column 8, lines 35-55).

As per claim 2, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 1, wherein the marked data is a data packet that is marked with data congestion information (flagging a packet if above congestion level; column 6, lines 34-41 and 66-67; column 7, lines 1-5; Figure 4).

As per claim 3, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 1, wherein the unmarked data is a data packet without data congestion information (not flagging a packet if below congestion level; column 6, lines 33-41; Figure 4).

As per claim 4, a method for optimizing data transmission in a data transfer system as recited in claim 1, wherein the marking data during data transfer congestion includes:

sending a data packet to a routing mechanism (sending a packet over a network; column 6, lines 16-33; Figure 1);

determining a fraction of the input buffer of the routing mechanism that is filled (checking the load in a router; column 6, lines 1-15);

randomly marking the data packet according to a probability identical to the fraction of the input buffer that is filled, the random marking indicating data transfer congestion (marking the data packet; column 6, lines 34-55),. And

generating an acknowledgement data by a recipient of the data packet, the acknowledgment data being marked if the data packet is marked (sending an acknowledgement; column 6, lines 56-65).

As per claim 5, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 4, wherein the detecting marked data includes:

receiving the acknowledgment data from the recipient of the data packet (sending an acknowledgment; column 6, lines 34-55); and

analyzing the acknowledgement data to determine if the data packet was marked (checking for a flag in the acknowledgment; column 6, lines 56-65).

As per claim 6, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 2, wherein the reducing further includes decreasing the data transmission rate by one data packet per round trip time (PRTT) for every marked packet detected (decreasing the rate if too much congestion; column 7, lines 28-57; column 8, lines 35-55; column 9, lines 17-25; column 11, lines 5-65).

As per claim 7, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 3, wherein the increasing further includes transmitting one additional

data only the unmarked data packets are detected during a previous round trip time (increasing the rate after it was decreased if packets no longer flagged; column 9, lines 53-67; column 10, lines 1-18; column 11, lines 5-65).

As per claim 8, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 2, wherein the marking the data packet includes setting data congestion information in an internet protocol header of the data packet (flagging the packet in the header; column 5, lines 64-67; column 6, lines 1-6 and 34-36).

As per claim 9, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 2, wherein the generating acknowledgement data includes setting data congestion information in an acknowledgment header if the data packet is marked (flagging the ACK; column 6, lines 8-13 and 34-36).

As per claim 10, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 4, wherein the acknowledgement data is a positive acknowledgement (ACK) (sending an ACK for receiving a packet; column 6, lines 8-13).

As per claim 11, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 1, wherein the data transfer system includes at least a sending host, a sending switch, and a data recipient (the network system; column 5, lines 44-54; column 14, lines 53-57; Figure 1 and respective part of specification).

As per claim 12, Jain discloses a method for optimizing data transmission in a data transfer system as recited in claim 11, wherein the data recipient includes at least one of a receiving host and a receiving switch connected to the receiving host (the network system; column 5, lines 44-63; Figure 1 and respective portion of specification).

As per claim 13, Jain discloses a network system for actively controlling congestion to optimize throughput comprising:

a sending host being configured to send packet traffic at a set rate (sending device sending packet at a set rate; column 5, lines 44-67; column 6, lines 1-33);

a sending switch for receiving the packet traffic, the sending switch including (a router; column 5, lines 44-54),

an input bufer for receiving the packet traffic at the set rate, the input buffer being actively monitored to ascertain a capacity level (an input buffer; column 5, lines 55-67; column 6, lines 1-16);

code for setting a probability factor that is correlated to the capacity level, the probability factor increasing as the capacity level increases and decreasing as the capacity level decreases (process for assessing congestion; column 11, lines 5-28);

code for randomly generating a value, the value being indicative of whether packets being sent by the sending switch are to be marked with a congestion indicator (process for flagging packet; column 6, lines 34-48); and

transmit code forwarding the packet traffic out of the sending switch, the packet traffic including one of marked packets and unmarked packets (process for sending packet; column 6, lines 48-55); and

a receiving end being configured as the recipient of the packet traffic and configured to generate acknowledgment packets back to the sending host, the acknowledgment packets being marked with the congestion indicator when receiving marked packets and not being marked with the congestion indicator when receiving unmarked packets (receiving the packet and analyzing it; column 5, lines 1-20; column 6, lines 56-65).

As per claim 14, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the sending host is configured to monitor the acknowledgment packets and to adjust the set rate based on whether the acknowledgment packets are marked with the congestion indicator (monitor the ACKS and adjust rate accordingly; column 6, lines 56-65; column 11, lines 5-65).

As per claim 15, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the set rate is a number of packets sent per round trip time (RTT) as determined by a congestion window in the sending host (the rate is determined by the congestion window; column 6, lines 1-6; column 7, lines 18-28; column 11, lines 5-65).

As per claim 16, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 15, wherein the congestion window operates to limit the amount of data that can be transmitted by the sending host before the acknowledgement packet is received (congestion window is limit of data that can be transferred; column 6, lines 7-15).

As per claim 17, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the sending, host decreases the set rate every time one of the marked packets is detected (decreasing rate when packets are received as flagged; column 9, lines 4-25; column 11, lines 5-65).

As per claim 18, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 17, wherein the set rate is decreased by one packet per round trip time (PRTT) for each of the marked packets that is detected by the sending host (decreasing the rate; column 7, lines 16-26; column 9, lines 4-25).

As per claim 19, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 17, wherein the sending host increases the set rate when no marked packets are detected per round trip time (PRTT) (increasing the rate when no more flagged packets are detected; column 11, lines 5-65; column 12, lines 19-35).

As per claim 20, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 19, wherein the set rate is increased by one packet per

round trip time (PRTT) (increasing the number of packets sent; column 11, lines 5-65; column 12, lines 49-35).

As per claim 21, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the actively monitored is an examining of the input buffer and a determining of an amount of the packets in the input buffer (checking buffer; column 7, lines 28-50 and 58-67; column 8, lines 1-34; column 9, lines 4-25).

As per claim 22, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the capacity level is a fraction of the input buffer that is filled with the packets (measuring capacity level; column 7, lines 58-67; column 9, lines 4-25; column 11, lines 5-65).

As per claim 23, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the probability factor is a percentage probability that one of the packets sent from the sending switch to the receiving end will be marked (optimizing the throughput; column 8, lines 1-34; column 9, lines 4-25', column 11, lines 5-65).

As per claim 24, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the value is a randomly generated number

between 1 and 100 (setting a random value, including the value of 1; column 9, lines 4-29; column 11, lines 5-65).

As per claim 25, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 13, wherein the congestion indicator is data in the IP header of the packets showing that data transfer congestion exists (flagging the packet in the header; column 6, lines 34-36).

As per claim 26, Jain discloses a method for actively controlling congestion to optimize throughput comprising:

transferring a data packet to an input buffer of a sending switch at a set rate (sending data at a set rate; column 5, lines 44-67; column 6, lines 1-33);

monitoring the input buffer to ascertain a capacity level of the input buffer (monitoring the capacity of the buffer; column 5, lines 55-67; column 6, lines 1-16);

setting a probability factor that is correlated to the capacity level of the input buffer, the probability factor increasing as the capacity level increases and decreasing as the capacity level decreases (setting a process for checking capacity; column 8, lines 1-34; column 9, lines 4-25; column 11, lines 5-65);

randomly generating a value, the value being indicative of whether the data packet sent by the sending switch is to be marked with a congestion indicator (deciding when to mark a packet; column 9, lines 4-29,. column 11, lines 5-65);

forwarding the data packet out of the sending switch to a recipient, the data packet being one of a marked data packet and an unmarked data packet (sending the data packet; column 6, lines 34-67); and

generating an acknowledgment packet to be sent from the recipient to the sending host, the acknowledgment packet being marked with the congestion indicator when receiving the marked data packet and not being marked with the congestion indicator when receiving the unmarked data packet (sending an ACK with the same flag as the packet; column 6, lines 56-65; column 11, lines 5-65).

As per claim 27, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 26, further comprising:

monitoring the acknowledgment packets (monitoring the ACKS,' column 6, lines 34-65); and adjusting the set rate based on whether the acknowledgment packet is marked with the congestion indicator (adjusting rate accordingly: column 7, lines 18-28 and 58-67: column 8, lines 35-55).

As per claim 28, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 27, wherein the set rate is a number of data packets sent per round trip time (PRTT) as determined by a congestion window in the sending host (setting a rate determined by window; column 6, lines 1-6., column 7, lines 18-28,. column 11, lines 15-65).

As per claim 29, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 28, wherein the congestion window operates to limit the amount of the data packets that can be transmitted by the sending host before the acknowledgement packet is received (setting a limit on the congestion window and operating normally when no congestion; column 6, lines 7-15).

As per claim 30, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 26, wherein the sending host decreases, the set rate every time one of the marked data packets is detected (adjusting the rate; column 9, lines 4-25; column 11, lines 5-65).

As per claim 31, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 30, wherein the set rate is decreased by one data packet per round trip time (PRTT) for each of the marked data packet that is detected by the sending host (adjusting the rate; column 7, lines 16-26; column 9, lines 4-25).

As per claim 32, Jain discloses a method for actively controlling, congestion to optimize throughput as recited in claim 30, wherein the sending host increases the set rate when no marked data packets are detected per round trip time (PRTT) (adjusting the rate based on the flag; column 11, lines 5-65; column 12, lines 19-35).

As per claim 33, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 32, wherein the set rate is increased by one data packet per round trip time (PRTT) (increasing amount of packets sent; column 11, lines 5-65; column 12, lines 19-35).

As per claim 34, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 26, wherein the actively monitored is an examining of the input buffer and a determining of an amount of the packets in the input buffer (determining a level for congestion; column 7, lines 28-50 and 58-67*, column 8, lines 1-34,. column 9, lines 4-25).

As per claim 35, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 26, wherein the capacity level is a fraction of the input buffer that is filled with a plurality of the data packet (determining the capacity level; column 7, lines 58-7; column 9, lines 4-25; column 11, lines 5-65).

As per claim 36, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 26, wherein the probability factor is a percentage probability that the data packet sent from the sending switch to the receiving end will be marked (setting a process for flagging the packets; column 8, lines 1-34; column 9, lines 4-25; column 11, lines 5-65).

As per claim 37, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 26, wherein the value is a randomly generated number

between 1 and 100 (generating a value including the value of 1; column 9, lines 4-29; column 11, lines 5-65).

As per claim 38, Jain discloses a network system for actively controlling congestion to optimize throughput as recited in claim 26, wherein the congestion indicator is data in the IP header of the data packet showing that data congestion exists (setting the flag in the header; column 5, lines 64-67; column 6, lines 1-6 and 34-36).

As per claim 39, Jain discloses a method for actively controlling congestion to optimize throughput comprising:

transferring a data packet to an input buffer of a sending switch at a set rate (sending data at a set rate; column 5, lines 44-67; column 6, lines 1-33);

monitoring the input buffer to ascertain a capacity level of the input buffer (monitoring the capacity of the buffer; column 5, lines 55-67; column 6, lines 1-16);

setting a probability factor that is correlated to the capacity level of the input buffer, the probability factor increasing as the capacity level increases and decreasing as the capacity level decreases (setting a process for checking capacity; column 8, lines 1-34; column 9, lines 4-25; column 11, lines 5-65);

randomly generating a value, the value being indicative of whether the data packet sent by the sending switch is to be marked with a congestion indicator (deciding when to mark a packet; column 9, lines 4-29; column 11, lines 5-65);

forwarding the data packet out of the sending switch to a recipient, the data packet being one of a marked data packet and an unmarked data packet (sending the data packet; column 6, lines 34-67); and

generating an acknowledgment packet to be sent from the recipient to the sending host, the acknowledgment packet being marked with the congestion indicator when receiving the marked data packet and not being marked with the congestion indicator when receiving the unmarked data packet (sending an ACK with the same flag as the packet', column 6, lines 56-65; column 11, lines 5-65);

monitoring the acknowledgment packets (monitoring the ACKS; column 6, lines 34-65); and adjusting the set rate based on whether the acknowledgment packet is marked with the congestion indicator (adjusting rate accordingly; column 7, lines 18-28 and 58-67; column 8, lines 35-55).

As per claim 40, Jain discloses a method for actively controlling congestion to optimize throughput as recited in claim 39, wherein the set rate is a number of packets sent per round trip time (PRTT) as determined by a congestion window in the sending host (setting a rate determined by window; column 6, lines 1-6; column 7, lines 18-28; column 11, lines 15-65).

Response to Arguments

Applicant's arguments filed June 7, 2004 have been fully considered but they are not persuasive.

Applicant argues that Jain does not disclose or suggest reducing the data transfer in direct correlation to the level of data transfer congestion. In response, Applicant is urged to refer to the initial rejection of the claim, which included columns 5, lines 44-67, column 6, lines 1-33 and 56-65 and column 8, lines 1-7. For further detail, column 8, lines 8-55; column 9, lines 42-67, column 10, lines 1-18 and column 11, lines 57-67 are also cited. Applicant cites column 11, lines 15-27 and argues that the claim limitations are not anticipated by the reference, however, the Applicant cited portion of the reference is one small portion and points to only one embodiment. In the Examiner cited portions of the reference, the reference teaches reducing data transfer in correlation to load. The reference teaches that in response to the feedback information of how much traffic is going through the routers, the router adjusts its throughput accordingly and adapts its service of packets based on the load (column 6, lines 61-65; column 8, lines 8-55).

Applicant argues that the cited portions of Jain do not disclose or suggest the feature of setting a probability factor where the probability factor increases as the capacity level increases and decreases as the capacity level decreases. Applicant is directed to column 8, lines 8-55. The reference teaches calculating an average queue length which correlates to the capacity level and increases as the capacity increases and decreases as the capacity decreases. This average queue length is a probability factor that adjusts as load changes over different periods of time. It is calculated based on previous and present cycles to obtain a probable future load of the router.

Applicant argues that Jain fails to disclose the randomly generating a value where the value is indicative of whether the data packet sent by the sending switch is to be marked with a congestion indicator. Once again, Applicant cites column 8 lines 35-55, a small portion of the reference, which refers to a specific embodiment. The Examiner cited portions of the reference,

however, anticipate the limitations of the claims. The reference teaches taking samples of load levels at random times and using a calculation of those values to determine whether or not a flag is to be set on packets from certain sources. Applicant is directed to column 6, lines 44-65 and column 7, lines 1-16 and column 8, lines 35-55 of Jain.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Uzma Alam whose telephone number is (571) 272-3995. The examiner can normally be reached on Monday-Tuesday 11:30am-8pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Uzma Alam
Ua

SALEH NAJJAR
PRIMARY EXAMINER